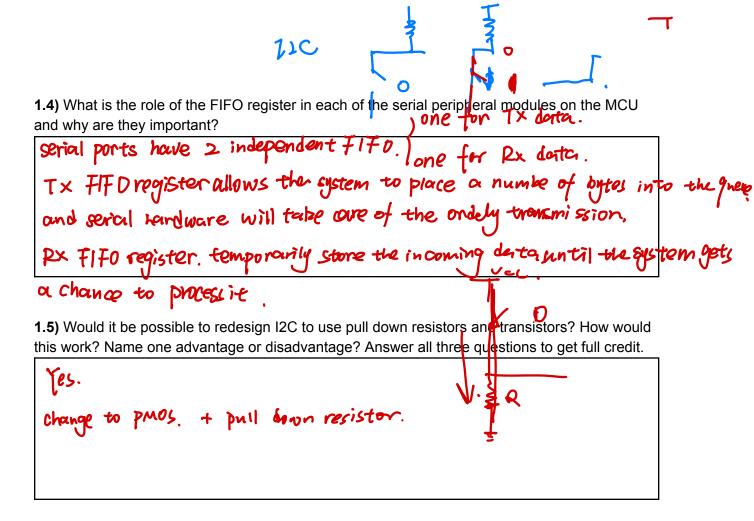
EECS 373 - Homework #6

or this assignment, make a copy of this Google Doc and use the answer boxes provided to fill the answers to the questions. The source file for this document can be found on the class ebsite. Students are encouraged to type out their answers, but neatly handwritten answers will so be accepted where appropriate. Gradescope is set up to accept variable length signments. Once students upload a PDF of their completed assignment to Gradescope they ill need to designate where they responded to each question. Question 1: Short Answer [20 points, 4 each] riefly answer the following questions about different communication interfaces: 1) Why do we use serial interfaces when communicating with peripheral devices, when smallel buses with multiple data lines can be simpler and faster? **COST** Less wine.* **Not high speed communication** 12) What are the disadvantages of UART relative to the other serial interfaces (I2C, SPI)? **Longer listomage** **Longer lis	Name:		unique nam		
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Question 2: Serial Tradeoffs [16 points]

Put an "X" in the appropriate box if the statement is true. Otherwise leave the box blank. A given statement can be true for all, some, or none of the given interfaces.

Statement	UART	I2C	SPI
Has a clock signal for synchronization	. X	V\	
Selects target device with a select wire	X 1.	X	~
Allows multiple devices to initiate transaction	×V		MX
Capable of sending data in two directions at once	V	7.	
Sends an address as part of its protocol	X		X



Question 3: SPI Waveform [19 points]

Using an MCU you are asked to communicate with an external SPI module. When the SPI controller sends the SPI peripheral a 'U' in ASCII the device responds with an ASCII 'M'.

Assume all data is sent and received in MSB first format and the SPI modules are in SPI Mode

3. Your task is to draw a timing diagram of this transaction. Make sure to clearly label the relevant data bits and signaling events.

For convenience you can use the timing diagrams below or draw your own from scratch.

Model 8:

SCLK

COPP

CIPO

CIPO

CIPO

CIPO

CIPO

CIPO

CIPO

CIPO

M.: 0 | 00 | 10 | 1

Question 4: I2C Waveform [25 points]

96 ,7 = 103.

You are given a temperature sensor that communicates via I2C. You write the ASCII character 'F' to the address 0x41. You then read from that address and receive the temperature in degrees Fahrenheit. The temperature sensor returns the decimal value 103. Draw the waveform for the transaction. Make sure to clearly label the relevant data bits and signaling events.

For convenience you can use the two blank timing diagrams below or draw your own from scratch. * 12 0×41 write "F"

更从OX41 Read "1035

